Technology Transition Initiative Proposal (FY 06)

Contents:

Applicable only if Selected as a Finalist

Introduction

The Department of Defense (DoD) Science and Technology Labs produce cutting-edge technologies for our warfighters. However, under the federal government's 2-year budgeting process, the transition of promising technological capabilities/enhancements from the Labs to Acquisition Programs and Sustainment organizations can languish waiting for acquisition and operational funding. During this time, some technologies become obsolete or their continued maturation is cancelled due to a lack of funds. The DoD has characterized this phenomenon with the phrase "Valley of Death". The Technology Transition Initiative (TTI), established by Congress in the FY2003 National Defense Authorization Act, funds such technology projects, enabling them to complete their development and testing phases in a timely manner to meet the requirements for insertion into the relevant government acquisition programs. The ultimate goal is to assure transition of advanced capabilities to the warfighter.

Summary of TTI Legislation

The specific requirements of the TTI are codified in Title 10 USC, Chapter 139, Sec. 2359a. The following is a summary of the legislation:

- Purpose: "to facilitate the rapid transition of new technologies from science and technology programs of the Department of Defense into acquisition programs of the Department for the production of such technologies."
- Objectives:
    1. "To accelerate the introduction of new technologies into operational capabilities for the armed forces"
    2. "To successfully demonstrate new technologies in relevant environments."
- Management of TTI
    - TTI is managed within USD/AT&L. Implementation of the program is assigned to DUSD (AS&C), OTT (Office of Technology Transition)
    - The legislation established the Technology Transition Council (TTC) from which the TTI Manager shall obtain advice and other assistance. The TTC is comprised of the following representatives:
        1. The science and technology executive of each military department and each defense agency
        2. The acquisition executive of each military department
        3. The members of the Joint Requirements Oversight Council
    - A Technology Transition Working Group (TTWG) was identified by the TTC to represent them in the working-level implementation of the program.
- Selection of Projects
    - The science and technology and acquisition executives of each military department and each appropriate Defense Agency and the commanders of the unified and specified combatant commands may nominate technology transition projects for implementation… and shall submit a list of the projects to the Manager.

    - The Manager, in consultation with the TTC (or TTWG), shall select projects for implementation from the projects on the lists submitted.
- Funding of Projects
    - The amount of funds provided to a project shall not be less than the amount equal to 50% of the total cost of the project.
    - A project shall not be funded for more than four fiscal years.

Annual TTI Project Identification and Selection Process

The process for identifying and selecting TTI projects is represented in Figure 1.

1. A formal project call from DUSD (AS&C) will be issued to the military services, defense agencies and combatant commands in the June timeframe each year.
2. The military services, defense agencies and combatant commands shall develop proposals that are vetted through their respective TTWG representative.
3. Each TTWG representative shall evaluate, score and rank the proposals for their military service, defense agency or combatant command. They shall forward their scored and ranked project recommendations to the TTI manager at OSD. Note that the TTWG member may identify and advocate those programs that fill a critical need, but don't score highly against the prescribed criteria.
4. The TTI manager shall review the proposals submitted through each military service, defense agency and combatant command and perform an initial screening against the defined TTI criteria.
5. Finalists in the selection process will present a short briefing to the TTI Manager to supplement the information in the written proposal and provide clarification.
6. The TTI Manager will recommend TTI projects to DUSD (AS&C) for approval.
7. Upon notification of selection, the successful project proposals will be required to submit to the TTI Manager a signed Technology Transition Agreement (TTA) between the Technology Developing organization and the relevant Acquisition/Sustainment Program manager committing to transition of the developed technology. The TTA shall be specific to the project and shall address the elements identified in Appendix E to clearly establish the TTI project metrics and schedule necessary for transition/insertion.

   Note that the proposal preparation process should lay the foundation for the TTA since the time period between notification of selection and funding availability is very short.

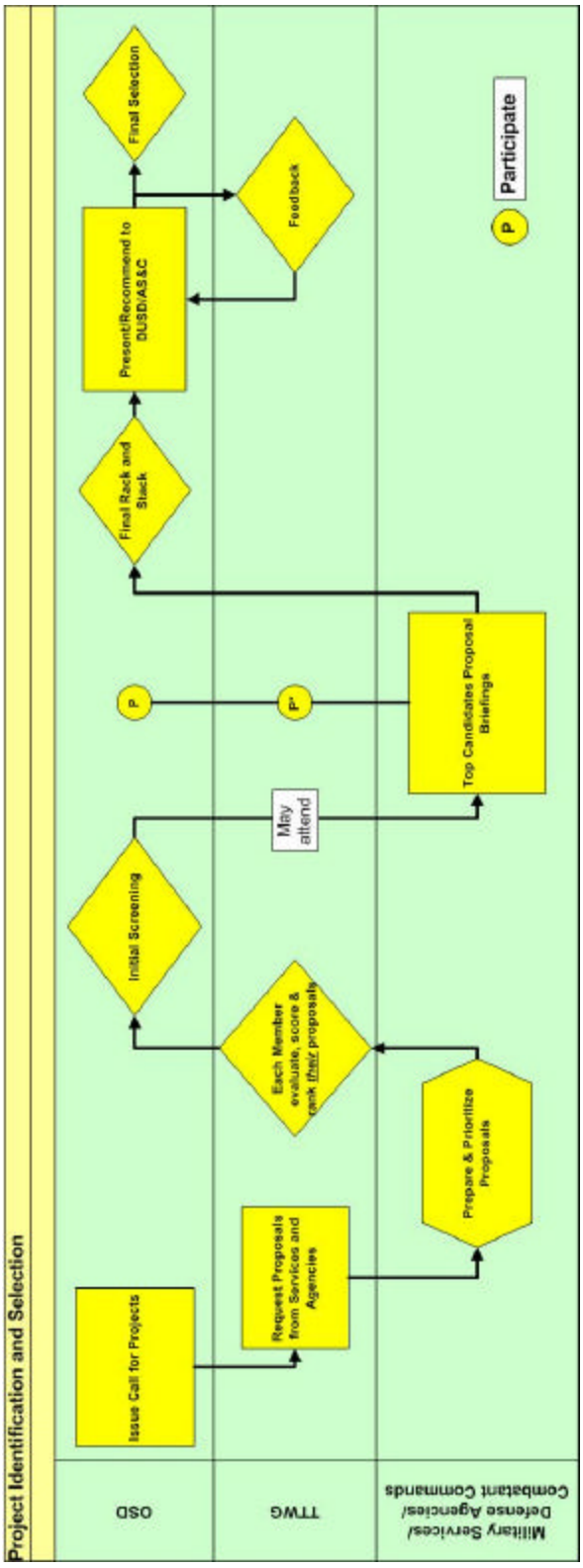

Figure 1: Project Identification and Selection Process

Proposed FY06 TTI Project Submittal Template ver 11 phone only and Background Information 06/28/05

Table 1: Evaluation Criteria for TTI Projects

Total Possible Score = 1,000 points

	Criteria	Weight	Score 0 – 5	How evaluated/graded
1	Technology must be from DoD S&T base (Mandatory)	5		Proposal addresses legacy funding for technology developed. (6.1, 6.2, 6.3, SBIR, DARPA, etc.)
2	Cost sharing to leverage TTI funding (Mandatory)	10		• Cost share may be R&D, O&M or Procurement funds. • Cost share may not be funding prior to the TTI project nor follow-on acquisition funding after the proposed TTI project. • Maximum 49% cost share, assessed over duration of the TTI funded project, not individual years.
3	Project duration must be 4 years or less (Mandatory)	10		Projects of shorter duration that achieve transition success early are rated higher than longer duration projects . The goal is transition in 2 years or less.
4	Funding must accelerate technology transition into DoD acquisition/sustainment programs (Mandatory)	15		Compelling case that the TTI investment fills a gap between current S&T and acquisition funding and enables a capability sooner than would otherwise occur.
5	Technology Maturity at the time of proposal submission	15		TTI generally seeks mature technologies (TRL 6 or 7) to assure transition. On a case by case basis exception, a TRL 5 with high payoff will be considered.
6	Value to the Warfighter	40		Identify the extent to which deployment of the technology will directly impact the ability to prosecute/win a war, save lives, or provide other operational enhancements/efficiencies. • Link to the appropriate Functional Capability Area. • Identify Service or Joint strategic objective(s) or COCOM requirement supported. • Address from the "big picture" system-level. Near-term impact to Operation Iraqi Freedom or Combating Terrorism Task Force (CTTTF) will be graded higher. • Proposals identifying themselves as supporting CTTTF will be evaluated by a CTTTF representative
7	Established Exit Criteria	30		The acquisition customer has identified key performance parameters that must be achieved to secure their commitment for technology insertion.
8	Potential for joint use	25		Write to the potential pervasive application of the technology. Joint service/agency/combatant command applicability is desirable and in such cases a joint submission is encouraged.
9	Commitment to Transition	50		The most heavily weighted criterion. Strong evidence of commitment from receiving acquisition organization. Letter of Advocacy from relevant Military Service/Defense Agency/Combatant Command Acquisition Program Manager who will incorporate the technology into a weapons system or capability. Also, identify requested program budget data for acquiring program.

Technology Transition Initiative Proposal Template (FY 06)
--Submit through TTWG Representative –

TTI Proposals should be succinct but sufficiently detailed to clearly address the evaluation criteria. Target size should be 6 pages or fewer and address each of the questions listed. Proposals will only be accepted from members of the Technology Transition Working Group (TTWG) (TTWG List Attached).

From Service/Agency/Command name: _____

Proposal Title: _____

1. What is the technology/product(s) to be transitioned? Provide a description and photo(s) if available.

2. The technology must be from the DoD S&T base. (Evaluation Criterion # 1). Identify the S&T funding source and activity that has invested in its development.

	FY __	**FY__**	**FY__**	**FY__**	**FY__**
Service/Agency					
6.1					
6.2					
6.3					
SBIR					
DARPA					
Other					
Total					

3. Describe the current problem. Describe the proposed TTI project and how the current problem will be resolved. Please spell out all acronyms. Project description should be written at a level that assumes no prior knowledge by the reviewer of the technology or application.

4. Describe the funding profile required to assure transition of the technology upon completion of the TTI project. Include requested TTI funding and related cost share (Evaluation Criteria #2 and #3). Identify the specific source of the cost share funding. Note that the maximum duration of a TTI project is 4 years, however, the goal is to transition the technology in 2 years or less. Also, identify follow-on procurement funding (consistent with the program budget information provided in Item 11) that is anticipated by the acquisition/sustainment organization following transition.

		TTI Project Duration (4 years max)				**Follow-on Procurement**		
		FY __	**FY__**	**FY__**	**FY__**	**FY__**	**FY__**	**FY__**
TTI Funding								
Cost Share	Service:							
	Agency:							
	Command:							
	Industry:							
	Other:							
Follow-on Procurement								
Total								

Note: Modify the table as appropriate for the proposed duration of the TTI project. Extend the follow-on procurement information as far into the future as is reasonably feasible.

5. Describe how this proposed TTI project would accelerate technology/product transition, by how many months/years and why. (Evaluation Criterion #4). Provide timeline of current transition plan without assistance from TTI Program. Provide accelerated transition plan/timeline that will result from TTI Program. If transition of equipment/capability will be a spiral upgrade into a current Program of Record, provide the schedule for the Initial Operating Capability or Full Operating Capability for the Program of Record.

6. What is the Technology Readiness Level (TRL) at this time? What will be the TRL at the completion of the proposed TTI project? (Evaluation Criterion #5).

7. What will be the value to the warfighter of this transitioned technology? (Evaluation Criterion #6). Identify the Functional Capability Area this technology addresses (Battlespace Awareness, Force Protection, Force Application, Force Management, Force Training, Focused Logistics, Command and Control, and Net Centric).

8. What are the required exit criteria for this proposed project such that the acquisition program manager/procuring organization has agreed to insert this technology, thus assuring transition? (Evaluation Criterion #7).

9. How does this TTI project support Iraqi Freedom or the Combating Terrorism Technology Task Force (CTTTF)? (Evaluation Criterion #8).

10. What is the potential for joint use or joint capability? If joint capability, identify the lead service/agency/command or Joint Program Office. (Evaluation Criterion #9).

11. What is the military service/defense agency/combatant command's commitment to transition? (Evaluation Criterion #10). This is the most heavily weighted of the criteria because transition is a critical and reportable metric of the TTI program to Congress.

    The proposal must address two commitments: 1) the proposed cost share stated in item 4 and 2) the insertion of the developed technology into an acquisition/sustainment program.

    Proposal must include an advocacy letter from the relevant acquisition program manager(s)/procuring organization(s) articulating their pull for this technology and commitment to insert the technology in their acquisition/sustainment program. The score awarded for this criterion is influenced by the degree to which the advocacy letter makes a compelling case for:

    1. The value to the warfighter. (Supports criterion #6).
    2. Their commitment to insertion/implementation funding. What caveats exist regarding this commitment? What are the required exit criteria from the TTI program that must be met to assure insertion in their program? (Supports criterion #7). Are funds already identified in the approved POM to insert this technology? If not, what action(s) will be taken to assure funding for implementation?

Identify the Program Element Title, PE Number, Appropriation Type, and the project number (if applicable) for the relevant acquisition program.

PE Title: _____
PE Number: _____
Appropriation Type: _____
Project Number: _____

- What is the status of this procurement funding? (UFR, unfunded request, or above the line funding?)

A signed Technology Transition Agreement (TTA) will be required for all approved TTI projects before being funded. While a TTA is not required to be submitted with the proposal, the foundation for the TTA should be laid during proposal preparation since the time period between notification of selection and funding availability is very short.

12. Contact Information
(Name, organization, e-mail address, phone number)

Technology project manager:

Acquisition project manager:

Financial point of contact (for execution oversight of TTI funding):

Appendix A
Technology Transition Working Group Representatives

OSD

TTI Program Manager
Phone: 703-607-5316

Air Force

SAF/AQRT
Phone: 703-588-7813
Phone: 703-588-7859

Army

Deputy Director, Technology
Phone: 703-601-1543
Phone: 703-601-1580
Phone: 703-601-1537

Navy

Phone: 703-696-0445

USSOCOM

Directorate of Advanced Technology
Technology Transition Office
Phone: 813-828-9475

DARPA

Phone: 571-218-4209

DIA

Phone: 703-289-3124
Phone: 202-231-4453
Phone: 202-231-4833

DISA

Phone: 703-882-1002

DFAS

TBD

DLA

DLA-J 339
Phone: 703-767-1463

DTRA

Phone: 703-325-8137

Appendix A Continued

MDA

Phone: 703-882-6164
Phone: 703-882-6193
Phone: 703-882-6153
Phone: 703-882-6144

NGA

Phone: 703-735-3201

JROC

Phone: 703-614-3666
Alternate Phone: 703-614-9229

Appendix B
Definitions of Technology Readiness (TRLs)

Excerpted from DoD Technology Readiness Assessment Deskbook
September 2003
Prepared by DUSD (S&T)

Table III-1. TRL Definitions, Descriptions, and Supporting Information (Source: *Interim Guidebook*, dated October 30, 2002)

TRL	Definition	Description	Supporting Information
1	Basic principles observed and reported	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties.	Published research that identifies the principles that underlie this technology. References to who, where, when.
2	Technology concept and/or application formulated	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative, and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.	Publications or other references that outline the application being considered and that provide analysis to support the concept.
3	Analytical and experimental critical function and/or characteristic proof of concept	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.	Results of laboratory tests performed to measure parameters of interest and comparison to analytical predictions for critical subsystems. References to who, where, and when these tests and comparisons were performed.
4	Component and/or breadboard validation in [a] laboratory environment	Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in the laboratory.	System concepts that have been considered and results from testing laboratory-scale breadboard(s). References to who did this work and when. Provide an estimate of how breadboard hardware and test results differ from the expected system goals.
5	Component and/or breadboard validation in [a] relevant environment	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so they can be tested in a simulated environment. Examples include "high-fidelity" laboratory integration of components.	Results from testing a laboratory breadboard system that are integrated with other supporting elements in a simulated operational environment. How does the "relevant environment" differ from the expected operational environment? How do the test results compare with expectations? What problems, if any, were encountered? Was the breadboard system refined to match the expected system goals more nearly?

Appendix B Continued

Table III-1. TRL Definitions, Descriptions, and Supporting Information (Source: *Interim Guidebook*, dated October 30, 2002) (Continued)

TRL	Definition	Description	Supporting Information
6	System/subsystem model or prototype demonstration in a relevant environment	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high-fidelity laboratory environment or in [a] simulated operational environment.	Results from laboratory testing of a prototype system that is near the desired configuration in terms of performance, weight, and volume. How did the test environment differ from the operational environment? Who performed the tests? How did the test compare with expectations? What problems, if any, were encountered? What are/were the plans, options, or actions to resolve problems before moving to the next level?
7	System prototype demonstration in an operational environment	Prototype near, or at, planned operational system. Represents a major step up from TRL 6, requiring demonstration of an actual system prototype in an operational environment such as an aircraft, vehicle, or space. Examples include testing the prototype in a test bed aircraft.	Results from testing a prototype system in an operational environment. Who performed the tests? How did the test compare with expectations? What problems, if any, were encountered? What are/were the plans, options, or actions to resolve problems before moving to the next level?
8	Actual system completed and qualified through test and demonstration	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.	Results of testing the system in its final configuration under the expected range of environmental conditions in which it will be expected to operate. Assessment of whether it will meet its operational requirements. What problems, if any, were encountered? What are/were the plans, options, or actions to resolve problems before finalizing the design?
9	Actual system proven through successful mission operations	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. Examples include using the system under operational mission conditions.	Operational test and evaluation reports.

Appendix B Continued

Table III-2. Additional Definitions of TRL Descriptive Terms
(Source: *Interim Guidebook*, dated October 30, 2002)

Term	Definition
Breadboard	Integrated components that provide a representation of a system/subsystem and that can be used to determine concept feasibility and to develop technical data. Typically configured for laboratory use to demonstrate the technical principles of immediate interest. May resemble final system/subsystem in function only.
High Fidelity	Addresses form, fit, and function. High-fidelity laboratory environment would involve testing with equipment that can simulate and validate all system specifications within a laboratory setting.
Low Fidelity	A representative of the component or system that has limited ability to provide anything but first-order information about the end product. Low-fidelity assessments are used to provide trend analysis.
Model	A functional form of a system, generally reduced in scale, near or at operational specification. Models will be sufficiently hardened to allow demonstration of the technical and operational capabilities required of the final system.
Operational Environment	Environment that addresses all the operational requirements and specifications required of the final system to include platform/packaging.
Prototype	A physical or virtual model used to evaluate the technical or manufacturing feasibility or military utility of a particular technology or process, concept, end item, or system.
Relevant Environment	Testing environment that simulates the key aspects of the operational environment.
Simulated Operational Environment	Either (1) a real environment that can simulate all of the operational requirements and specifications required of the final system or (2) a simulated environment that allows for testing of a virtual prototype; used in either case to determine whether a developmental system meets the operational requirements and specifications of the final system.

Appendix C
Software-Specific Definitions and Descriptions of Technology Readiness Levels (TRLs)

Excerpted from DoD Technology Readiness Assessment Deskbook
September 2003
Prepared by DUSD (S&T)

TRL	Definition	Description
1	**SW**: Functionality conjectural	Lowest level of software readiness. Basic research begins to be translated into applied research and development. Examples might include a concept that can be implemented in software or analytic studies of an algorithm's basic properties.
2	**SW**: Technology concept and/or application formulated	Invention begins. Once basic principles are observed, practical applications can be invented. Applications may be speculative and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic studies.
3	**SW**: Analytical and experimental critical functions and/or characteristic proof of concept	Active research and development is initiated. This includes analytical studies to produce code that validates analytical predictions of separate software elements. Examples include software components that are not yet integrated or representative but satisfy an operational need. Algorithms run on a surrogate processor in a laboratory environment.

Appendix C Continued

TRL	Definition	Description
4	**SW:** Functionality demonstrated in a laboratory environment	Basic software components are integrated to establish that they will work together. They are relatively primitive with regard to efficiency and reliability compared with the eventual system. System software architecture development initiated to include interoperability, reliability, maintainability, extensibility, scalability, and security issues. Software integrated with simulated current/ legacy elements as appropriate.
5	**SW:** Functionality and performance demonstrated in a relevant environment	Reliability of software ensemble increases significantly. The basic software components are integrated with reasonably realistic supporting elements so that it can be tested in a simulated environment. Examples include "high-fidelity" laboratory integration of software components. System software architecture established. Algorithms run on a processor(s) with characteristics expected in the operational environment. Software releases are "Alpha" versions and configuration control initiated. Verification, Validation, and Accreditation (VV&A) initiated.
6	**SW:** Functionality and performance demonstrated in a realistic simulated (live/virtual) operational environment	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in software-demonstrated readiness. Examples include testing a prototype in a live/virtual experiment or in simulated operational environment. Algorithm run on processor or operational environment integrated with actual external entities. Software releases are "Beta" versions and are configuration controlled. Software support structure in development. VV&A in process.
7	**SW:** Functionality and performance demonstrated in an operational test environment.	Represents a major step up from TRL 6, requiring the demonstration of an actual system prototype in an operational environment, such as in a command post or air/ground vehicle. Algorithms run on processor of the operational environment integrated with actual external entities. Software support structure in place. Software releases are in distinct versions. Frequency and severity of software deficiency reports do not significantly degrade functionality or performance. VV&A completed.

Appendix C Continued

TRL	Definition	Description
8	**SW:** Functionality, performance, and quality attributes validated in an operational environment.	Software has been demonstrated to work in its final form and under expected conditions. In most cases, this TRL represents the end of system development. Examples include test and evaluation of the software in its intended system to determine if it meets design specifications. Software releases are production versions and are configuration controlled in a secure environment. Software deficiencies are rapidly resolved through support structure.
9	**SW:** Functionality, performance and quality attributes proven in an operational environment through successive successful accomplishment of mission operations.	Actual application of the software in its final form and under mission conditions, such as those encountered in operational test and evaluation. In almost all cases, this is the end of the last "bug fixing" aspects of system development. Examples include using the system under operational mission conditions. Software releases are production versions and are configuration controlled. Frequency and severity of software deficiencies are at a minimum

Appendix D
Finalist Presentation

Authors of proposals that score highly may be requested to make a presentation to the TTI Manager at OSD. The purpose of the presentation is to clarify questions that arise in the proposal review process. The prime objective of the presentation is to complement the submitted proposal with greater detail regarding the technology, its maturity, the proposed application and insertion of the technology, and its probability of success and transition. A presentation template will be provided to the finalists. TTWG members will be invited to attend the presentations.

- Who is your customer & what are their requirements?
- What are the technology options to meet these requirements & why is the proposed approach best?
- What is the benefit of the transitioned technology to the warfighter?
- What are the key performance parameters/exit criteria such that the customer agrees to insert this technology and assure transition?
- What are the risks to developing and transitioning the proposed technology?
- How will you structure your program to meet requirements and mitigate risk?
- What is your customer's level of commitment for transition? Follow-on funding for acquisition?

Supplemental Information:

- What businesses are involved: name, location, small business?

Appendix E
Elements of Technology Transition Agreement

Excerpted from Manager's Guide to Technology Transition
in an Evolutionary Acquisition Environment, Appendix D
Defense Procurement and Acquisition Policy
Office of the Undersecretary of Defense
(Acquisition, Technology & Logistics)

No generic template is available for a successful technology transition plan. However, all technology transfer plans have elements in common. In general, technology transition plans should have the following elements:

- A technology development outline. This describes the technology development pathway in detail.
- Expected outcomes of the project. The outcomes should be measurable and achievable "exit criteria".
- Funding strategy. The strategy names the resources to be provided according to source, amount, and timing.
- Schedule and milestones, including a transition or handoff schedule.
- Identification of the "customer."
- Acquisition strategy and integration plan.
- Issues and risks—for cost, schedule, technical, manufacturability, sustainment.
- Signed "customer" and program manager agreement for funding, schedule, and deliverables.
- "Customer" funding strategy for acquisition and fielding.
- Plan from multiple sources for using the technology, and encouraging innovation in the program.